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In order to test the hypothesis that independent study is at least as effective as the more usual lecture technique, groups of comparable students in the same course and with the same instructor were divided into control and experimental groups which utilized the independent study method. At end of term each of the groups underwent a battery of tests—objective, essay, and laboratory. Results showed no difference in the two groups with regard to any of the tests nor in later retention tests. Although student opinion tended to prefer the traditional methods, there was an improvement of attitude towards independent study.

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ANTIOCH COLLEGE REPORTS

Published by the Office of Educational Research, Antioch College, Yellow Springs, Ohio (March, 1961)

2 Experiment in Independent Study (1956-1960)[1]

American educators have long been critical of our practice of spoon feeding college students. Our colleges and universities, complains Clarence Faust, President of the Fund for the Advancement of Education, have adhered too long to a "packaging" theory of education. This theory is that learning can best, or only, take place when students attend classes a set number of hours over a set number of weeks. And while the size of the package may vary from three to five or more credits, credit for learning and learning itself are assumed to be closely related to how often the student sits in the classroom. Having amassed a fixed number of credits during four years, the student is assumed to have learned enough for the bachelor's degree.

What about the ways in which we have organized our patterns of teaching? How much of the teacher do we need? How far can we go in pressing for more student autonomy in learning?

This is a report on Antioch College's experimentation with varying methods of independent study as a part of its regular teaching procedures. It is the second in a series of digests being published on new program developments and research studies under way here.

Purposes of the Study

Antioch College has long sought to discover ways by which students could take a greater share of the responsibility for their own education. It has tried to achieve this objective in a variety of ways: in its programs of work experience and education abroad, where students are almost completely on their own;[2] in its plan for community government, where students lead in planning and conducting many activities of the college program; in using students in freshman orientation and our advising program, in which upper-class students are the only adult residential advisers in freshman dormitories; and in the Administrative Council, where students take part with faculty members in making decisions on college policies and program.

While the College has sought to provide comparable kinds of responsibility-taking experiences within its academic program (through tutorial studies and credit by examination), these experiences have been largely limited to its more able students. For the most part, students have been expected to attend regularly scheduled class meetings, three or five times a week for twelve or twenty-four weeks, depending on the number of credits offered. Implicit in this scheduling was the assumption that students needed at least this many meeting hours with the instructor to learn effectively. But did they?

Beginning in 1956, the College began to examine this assumption more closely. It proposed controlled group studies to test various methods of independent study in regular teaching. We wanted to see whether these independent study methods could help students take more responsibility for their own learning—and whether the College might not only increase the quality of students' education, but also save instructional time.

Hypotheses

Two principal hypotheses were proposed:

1. That students in the independent study courses would learn as much as those taking courses using regular lecture-discussion instruction.

2. That students in the independent study courses would be as satisfied with the courses as those taking courses using the regular lecture-discussion methods.

The College also sought to study the amount of instructional time used under both methods of instruction.

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[1]These studies have been under the direction of Samuel Baskin, Director of Educational Research, and Ruth Churchill, College Examiner. Paula John, Assistant to the College Examiner, and Robert Boyd, Assistant Professor of Education, assisted in the evaluation phases of the studies. W. Boyd Alexander, Dean of the Faculty, served as adviser to the study group.

[2]Under Antioch's educational plan of study-plus-work, students alternate their time between on- and off-campus experiences. As part of the off-campus experience, students hold regular jobs at regular pay. The program presently includes over 450 co-operating employers in thirty states. The College has recently extended this concept of education still further so that students are able to spend a full year abroad as a part of their degree program. About 150 students are expected to take part in this program in some twenty countries this year.

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Plan of the Studies

The experiment called for setting up control and experimental groups for most of the courses in this study.[3] Both groups were to be taught by the regular and the experimental methods. Both groups were to be taught by the same instructor, and both were matched on a number of variables, including field, year in college, sex, and background knowledge at the time of taking the courses. Students taking the courses were expected to cover the same course materials and to achieve the same course objectives as outlined in previously prepared syllabi. The principal difference between the groups was that the experimental groups used a period of independent work. This period varied from course to course; the independent study groups averaged twenty to thirty, and in some instances forty, fewer class hours than did those taught the regular way.[4]

Pre- and post-tests were employed to check on the comparability of the groups and their post-course achievements. A number of other instruments were used to find out students' satisfaction with and attitudes toward the way the course was conducted under the experimental and control methods.

The subjects of the study were students who enrolled in one of the courses during a quarter in which it was offered. In order to achieve as much comparability as possible between the groups and to avoid special motivational differences, students were not told in advance whether a course was taught by the experimental or control method.

Course instructors took part in a summer workshop in which they discussed their course objectives, their plans for teaching the control and experimental courses, how they hoped to build autonomy into their experimental offerings, and their plans for preparing students for independent work. Most of the instructors had volunteered to take part in the study; in order to have a greater spread of experimental courses, we asked other instructors to participate. No instructors were required to be in the experiments. The levels and fields of these courses are shown in Teaching Chart A.

TEACHING CHART A. COURSES IN INDEPENDENT STUDY EXPERIMENT

Instructor	*Course*	*Level**	*Department or Field*
Abrams	Twentieth-Century Europe	II	History
Ayoub	Problems in Anthropology†	I	Sociology
Fill r	Twentieth-Century America†	II	History
Finlay	Business Law	Field	Business Administration
Finlay	The Efficiency Principle in Management	Field	Business Administration
Gorden	Social Conflict and Disorganization†	Field	Sociology
Jerome	From Donne to Pope†	Field	Literature
Keeton‡	Present-Day Religion†	I	Philosophy
Keeton	Reflective Thinking†	I	Philosophy
Leuba	Psychology I: Basic Processes	I	Psychology
Loud	Physical Science of the Industrial Revolution†	I	Physical Sciences
Loud	Physical Science World Picture†	I	Physical Sciences
Lounsbury	Human Geography	II	Geography
Lounsbury	Introduction to the Earth Sciences†	I	Earth Sciences
McGary	Aesthetics†	II	Philosophy
McGary	History of Western Art†	II	Design
Sparks	American Government and Politics†	I	Government
Sparks	Politics in Society	II	Government
Wilson	Problems in Sociology†	I	Sociology

*I or II indicates whether the course is a Level I (beginning) or Level II (intermediate and advanced) general education course.

†Course taught by both experimental and control methods.

‡Taught in 1957-58 with Harrison.

NOTE: *This chart shows the courses included for study during the period 1956-60. Not all courses were offered each year and several courses were repeated in each of the study years.*

The Instruments of the Study

Pre-tests used to determine the comparability of the groups included the Yale I Educational Aptitude Test, as a measure of the students' scholastic ability; the Yale 5 Educational Aptitude Test, as a measure of mathematical ability; and several course examinations, including both subject-matter and task-oriented tests, as a measure of students' course knowledge at the time of beginning the course. In addition, members of the control and experimental groups were studied for their comparability on each of the following variables: field, sex, year in college, and rank in high school.

Post-course measures included multiple-choice and short-answer tests, to determine content learning, and essay, task, and laboratory problem assignments, to measure critical thinking ability and ability to handle complex problems.

Two measures were used to obtain evidence of the students' satisfactions and dissatisfactions with the teaching procedures: a teacher rating scale (Survey of Student Opinion of Teachers), which has been used at Antioch since 1947; and a student satisfaction scale developed for the study to get information about students' reactions to the teaching procedures used.[5]

In addition, instructors were asked to keep records of the time used in teaching the different ways. Thes records, filled out weekly, reported time spent in class, in conferences with students, in preparation for classes, and in evaluation of student work. The smallest unit of time used was a quarter of an hour.

[3]Of nineteen courses studied from 1956 to 1960, hirteen were taught by both experimental and control procedures.

[4]The reduction in instructional time ranged from 34 per cent to 61 per cent, with a median of 46 per cent.

[5]In addition to these measures, two other tests of skills in and attitudes toward independent study were used in the 1957-58 study. These were a Situational Problems Test developed at Antioch and five scales of the California Personality Inventory. These measures are described in more detail in the 1957-58 study report. See also Churchill, Ruth, *Evaluation of Independent Study in College Courses* (unpublished doctoral thesis), 1960, University of Minnesota.

The Independent Study Courses

Organization

Instructors were given considerable latitude in the method of independent study used. Some instructors used principally teams or small groups of five to ten students, who did their autonomous work together. Some instructors used individual study approaches, or what came to be known as the "lone wolf" method of independent study. Still others used combinations of small group and individual independent study.

Instructor-Student Meeting Patterns

Instructors were free to choose how they wished to organize their courses. Sometimes they asked students to do some independent work each week and meet once or twice a week with the instructor (in contrast to the control group, which met with the instructor for all regularly scheduled classes). Other instructors used "block units," meeting the experimental groups regularly during the early and latter parts of the course and scheduling blocks of completely independent work for one, two, or three weeks at intervals in the course. Still other instructors, depending on the instructional material and student needs, used different combinations of regular class meetings and independent work. Illustrations of two instructional patterns are shown in Teaching Charts B and C.

TEACHING CHART B. Use of "Continued Meeting" Pattern

Instructor-Student Meeting Pattern, Present-Day Religion, 1958-59
Professor Morris Keeton

Week	*Lecture-Discussion Method (Control)*			*Experimental Method*		
	Teacher-led lectures and discussions	Team meetings on own	Independent work in lieu of class or team meetings	Teacher-led lectures and discussions	Team meetings on own	Independent work in lieu of class meetings
1	3	0	0	3	0	0
2	5	0	0	2	3	0
3	5	0	0	1	4	0
4	5	0	0	1	4	0
5	5	0	0	2½	2½	0
6	5	0	0	1	3	1
7	5	0	0	3	2	0
8	5	0	0	3	2	0
9	4	0	0	1	1*	2
10	5	0	0	2	3*	0
11	5	0	0	0	0*	5
12	5	0	0	3	2*	0
Totals	57	0	0	22½	26½	8

*Team meetings optional beginning with ninth week.

Training Procedures

Considerable attention was given to preparing students for working on their own. Training materials developed for this purpose included discussion outlines and thought questions for the autonomous study groups, reference materials, and specially prepared instructional materials. Among the latter were aids designed for chairmen of small groups on how to lead a discussion, suggestions for discussion recorders, and suggested study tactics for individuals working on their own or in small groups.[6] In addition, a number of instructors conducted demonstration sessions on effective and ineffective work in small groups and held post-class conferences with the chairmen and recorders of small groups. While instructors spent different amounts of time in training groups or individuals for working on their own, some kind of training aid was prepared for each independent study group.

Comparability of the Groups

An analysis of the students in these courses revealed few academic differences in the experimental and control groups. When comparisons were made within any one year, the groups were similar in each of the major variables studied: scholastic and mathematical ability, course knowledge at the time of beginning the course, field, and year in college. In one of the lecture-discussion courses, there was a significantly larger number of physical science majors; and in three courses a significantly larger number of women than men were enrolled in the lecture-discussion courses. These differences arose largely from student scheduling and program problems and were not associated with any differences on the pre-test covering the course content and objectives.

[6] A number of these aids are being brought together in a manual on independent study that the College is preparing (Morris Keeton and Samuel Baskin, *Independent Study: A Teacher's Guide*) to help other faculty members train students for working on their own. The manual is scheduled for completion in late 1961.

TEACHING CHART C. Use of "Block Units"

Instructor-Student Meeting Pattern, Physical Science World Picture, 1957-58
Professor Oliver Loud

Week	*Lecture-Discussion Method (Control)*	*Experimental Method*
First two weeks	All students together for launching of course; experimental groups get special training for independent work as teams or "lone wolves."	
Third week to middle of sixth week	Control section continues regularly scheduled teacher-led class meetings (6 hrs. a week)	Teams or individuals function autonomously for 3½-week interval
Last half of sixth week	All students together for bringing first part of course to a close	
First half of seventh week	All students together for launching new departure	
Last half of seventh week through eleventh week	Control section continues regularly scheduled teacher-led class meetings (6 hrs. a week)	Teams or individuals function autonomously for 4½-week interval; each team meets at least once with instructor, and "lone wolves" meet as full group at least once with instructor
Final week	All students together for summarizing and evaluating course	
Total class hours	66	33

Results

Achievements of the Group

1. Students learned equally well whether they had studied under the regular method of instruction or under the experimental method of independent study. No significant pattern emerged favoring one group over the other. This held true whether multiple choice examinations, short answer tests, essays, or task assignments were used to evaluate the results. It held true for each year of the study, and it held true for both beginning and advanced courses.

2. Data on retention of learning (two years after completion of the course) revealed no significant differences favoring one group over the other.

3. There was no evidence that the independent study methods needed to be reserved for the superior or advanced student only. Students at differing levels of ability and at different year levels did well (or poorly) with these teaching methods. Academic potential, at least within the ranges studied at Antioch,[7] did not appear to be the sole determiner in the success or failure of these methods, and there were some indications that personality and attitudinal factors might be as important in learning by these methods as individual ability.

Satisfaction with Control and Experimental Methods

While students still tended to prefer the lecture-discussion teaching, they expressed a growing acceptance of and satisfaction with independent study as they became more familiar with it. The study data showed a decided shift in student attitudes from one of general dissatisfaction with independent study in 1956, to few differences in the degree of satisfaction under either method of instruction in 1960. There is little question, as our analyses of the student satisfaction scales and our conferences with students indicated, that students come to college largely unprepared for independent learning. If independent study methods are to succeed, students need a great deal of help in learning how to work on their own.

Use of Instructional Time

The study data revealed that there were few savings in instructional time during the early years of the study because of the additional time needed to prepare lesson material for the independent study groups. There was some indication, however, that time might be saved in some courses once the instructor had mastered the use of independent study and had completed the cycle of preparing special materials. This was especially true for several courses in the last two years of the experiment, including two philosophy courses in which the instructor saved up to 57 per cent of the total time that normal procedures would have required for the same number of students.

Conclusions

Although an instructor satisfaction scale was not used, instructor reactions to the experimental procedures were secured through written reports and individual conferences. Perhaps the best evidence of their feelings is the fact that most instructors (especially those participating in the studies since 1957) have continued to use independent study procedures, and in the fact that an increasing number of faculty members, including many who did not participate in the experimental studies themselves, are now offering students the opportunity for on- as well as off-campus independent study.

Antioch College does not view these new methods of instruction as a panacea for higher education's twin problems of quality and quantity. Nor does it view them as a glorified do-it-yourself plan that works simply by turning the student loose on his own; for the instructor must carefully select and structure the student's learning experiences. The instructor's job, although it may be different, is no less difficult.

While it is not clear that the experimental methods will result in a net saving in instructional time, for those who have been engaged in the study this fact in and of itself is not the significant point. The real promise of the studies is in the shift they may bring with them in the educational orientation of both students and teachers. Most importantly, they argue for the far greater use of the student's own resources for learning. They press us to shake ourselves loose from some of our educational habits, and they offer new assurances of the unused potential for learning—and one that we have hardly begun to tap—that exists within the student himself.

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[7]Surveying the results of some sixteen institutions (both public and private) that had engaged in similar research, a report of the Fund for the Advancement of Education notes that "Almost without exception, the customary academic examinations showed that students in the independent study experiments learned at least as much as the students who had regular class work. Rarely were there statistically significant differences in the performance of the experimental and the control groups on regular or special examination."

NOTE: *The experiments described in this report have been supported by grants from the Fund for the Advancement of Education. Full study reports are available from the Office of Educational Research, Antioch College, Yellow Springs, Ohio.*

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G.P.O.